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REMARKS

Claims 1-20 were pending in the subject application. Applicant has hereinabove canceled claims 3 and 10-13, without prejudice or disclaimer, and amended claims 1, 14 and 17-20. Accordingly, claims 1, 2, 4-9 and 14-20 are pending and presented for examination, with claims 1 and 14-16 being in independent form.

Claims 1, 14 and 17-20 have been amended to place the claims in better form for examination, without narrowing the scope of the claimed invention. Applicant maintains that no new matter is presented by this amendment. Accordingly, Applicant respectfully requests that this Amendment be entered.

Rejection under 35 U.S.C. §112, first paragraph

On page 2 of the June 3, 2003 Office Action, claims 1-20 were rejected under 35 U.S.C. §112, first paragraph, as allegedly containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

The Examiner stated that Applicant's amendments to claims 10-13 have not overcome the rejection. The Examiner further stated that the specification fails to describe an array with the different elements contained therein, as recited in claims 10-13. The Examiner also stated that claim 1 recites a protein-protein reaction between protein components. The Examiner further stated that it does not recite a protein-mRNA, protein-sugar and the other recited elements interaction.

Since claims 10-13 have been canceled without disclaimer or prejudice, the rejection is now moot with respect to those

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claims.

No basis were supplied in the June 3, 2003 Office Action for rejecting claims 1-9 and 14-20 under 35 U.S.C. §112, first paragraph.

Accordingly, Applicant respectfully requests that the Examiner reconsider and withdraw the rejection under 35 U.S.C. §112, first paragraph.

Rejection under 35 U.S.C. §112, second paragraph

On page 3 of the June 3, 2003 Office Action, claims 1-20 were rejected under 35 U.S.C. §112, second paragraph, as allegedly indefinite for failing to particularly point out and distinctly claim the subject matter which the applicant regards as the invention.

The Examiner stated that claim 1 omits essential steps. The Examiner further stated that the omitted essential step is in the determination of the protein-protein interaction or how the array is made such that interaction is accomplished and the non-interacting elements are removed from the substrate array.

The Examiner stated that claim 1, as amended, recites the Markush language "consisting essentially of". The Examiner also stated that this is still an improper Markush language. The Examiner further stated that the Markush language is "consisting of".

The Examiner stated that claim 3 is a broadening claim. The Examiner further stated that it is unclear whether a method of using and making are two different statutory subject matter requiring different steps. The Examiner further stated that there is no recitation in the base claim of a physiological condition.

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The Examiner stated that claims 10-13 and 17-20 are confusing and unclear as to whether each of these compounds form a part of the protein molecule or are separate, discrete components of the protein array. The Examiner also stated that the specification fails to positively teach or show as to how such array are prepared with these different compounds.

The Examiner stated that the term "corresponding" PDZ domain in claim 14, within the claimed context, is indefinite as in what manner or what constitutes a corresponding PDZ domain.

In response, without conceding the correctness of the Examiner's position but solely to advance the prosecution of the subject application, Applicant has hereinabove canceled claims 3 and 10-13, without prejudice or disclaimer, and amended claims 1, 14 and 17-20. Applicant maintains that the amendments to claims 1, 14 and 17-20 do not narrow the scope of the claims, but rather place the claims in better form for examination.

Regarding claim 1, the Office Action states that details of the protein-protein interaction are missing from the claim.

However, Applicant respectfully submits that it is not the purpose of, nor a requirement under the patent laws and rules for, patent claims to specify all the details of an invention. Patent claims are construed in light of the specification of which they are a part. If any details are missing from the claims, one of ordinary skill in the art would resort to the specification for the desired information. The U.S. Court of Appeals for the Federal Circuit recently reiterated in S3 Inc. v. Nvidia Corp., 259 F.3d 1364, 1369 (Fed. Cir. 1369) as follows:

"... claims are not a self-contained explanation of every step. That is not the role of claims ... The purpose of

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claims is not to explain the technology or how it works, but to state the legal boundaries of the patent ... A claim is not 'indefinite' simply because it is hard to understand when viewed without benefit of the specification."

Applicant maintains that the claims of this application, as amended, clearly and adequately define the legal bounds of the subject matter which the applicant regards as the invention.

Accordingly, Applicant respectfully requests that the Examiner reconsider and withdraw the rejection of the claims under 35 U.S.C. § 112, second paragraph.

Rejection Under 35 U.S.C. §103(a)

On page 5 of the June 3, 2003 Office Action, claims 1-20 were rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over Doyle et al. (1996) "Crystal Structures of a Complexed and Peptide-Free Membrane Protein-Binding Domain: Molecular Basis of Peptide Recognition by PDZ", Cell, 85:1067-1076 ("the Doyle paper") in view of any one of discussion in the Background section of the application, Schneider-Mergener (2001) "Synthetic peptide and protein domain arrays prepared by the SPOT technology", Comp. Funct. Genom., 2:307-309 ("the Schneider-Mergener paper") or Harris et al. (2001) "Mechanism and role of PDZ domains in signaling complex assembly", Jrnl. Cell Science, 114(18):3219-3231 ("the Harris paper").

The Examiner stated that the Doyle paper positively discloses the PDZ protein interaction with protein containing S/T-X-V/I/L (as claimed). However, the Examiner acknowledged that the Doyle paper does not disclose the interactions in an array.

The Examiner stated that the PDZ protein made in an array is

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disclosed either by the Schneider-Mergener paper or the Harris paper.

The Examiner stated that the Schneider-Mergener paper discloses the PDZ array and PDZ is known in the art to bind to its protein with a carboxyl containing e.g., SLV as taught by the Doyle paper or the Harris paper. The Examiner also stated that since an array of PDZ has been made by Schneider-Mergener, it is expected and known that said PDZ would react with its known binding partner, such as the SLV carboxyl containing protein.

Applicant maintains that the Doyle paper, the Schneider-Mergener paper and the Harris paper do not render obvious the invention claimed in the pending claims. The claimed invention is patentable over the Doyle paper, the Schneider-Mergener paper and the Harris paper for at least the following reasons.

The subject application describes high-throughput and low cost methodologies for preparing protein (or polypeptide) arrays based on biochemical interaction between proteins (or polypeptides). More specifically, Applicant found (through experimentation, such as described in the application) that a polypeptide which comprises an amino acid sequence (S/T)-X-(V/I/L)-COOH, is particularly suitable for binding to another polypeptide which comprises a PDZ domain. Applicant recognized that the biochemical interaction between these polypeptides can be harnessed to efficiently prepare polypeptide arrays which keep the polypeptides in a functionally active state and allow, for example, multiple drug screenings under physiological conditions, since the array elements can include oligonucleotides, mRNA, DNA, sugar, etc., in addition to the polypeptide.

The Doyle paper discloses that modular PDZ domains, which are found in many cell junction-associated proteins, mediate the

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clustering of membrane ion channels by binding to their C-terminus. Through X-ray crystallography, Doyle et al. determined the crystal structures of a complexed and peptide-free membrane protein-binding domain and molecular basis of peptide recognition by PDZ. Although the Doyle paper also refers to contemporaneous research involving PDZ domains, Applicant does not find teaching or suggestion in the Doyle paper that the interaction between a polypeptide which comprises an amino acid sequence (S/T)-X-(V/I/L)-COOH and another polypeptide which comprises a PDZ domain can be harnessed for preparing polypeptide arrays, such as claimed in independent claims 1 and 14-16, that would have a plethora of uses.

The Schneider-Mergener paper describes SPOT technology for spatially addressed synthesis of peptide arrays on flat surfaces (such as cellulose, polypropylene or glass). SPOT technology is exemplary of one type of conventional array synthesis techniques which may be adapted to practice the claimed invention of the subject application. The compounds can be coupled by different chemistries through several types of linkers to the flat surfaces, depending on the successive application of the arrays. Attachments via an ester bond or a photocleavable linker allows selective cleavage of the compounds from the surface for the purpose of quality control, or application of the compounds in standard micro-titer plate assay systems. Although the Schneider-Mergener paper mentions that SPOT technology may be applied to various types of peptides, such as PDZ domains, Applicant does not find teaching or suggestion in the Schneider-Mergener paper that the interaction between a polypeptide which comprises an amino acid sequence (S/T)-X-(V/I/L)-COOH and another polypeptide which comprises a PDZ domain can be harnessed for preparing polypeptide arrays.

The Harris paper is a survey of contemporaneous research

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involving PDZ domains, including in particular the mechanism and role of PDZ domains in signaling complex assembly. Although the Harris paper suggests that PDZ domains can function as protein-protein interaction modules, Applicant does not find teaching or suggestion in the Schneider-Mergener paper that the interaction between a polypeptide which comprises an amino acid sequence (S/T)-X-(V/I/L)-COOH and another polypeptide which comprises a PDZ domain can be harnessed for preparing polypeptide arrays.

Thus, although each of the Doyle paper, the Schneider-Mergener paper and the Harris paper describes bits and pieces of the background art, none of the cited art embodies the recognition that the interaction between a polypeptide which comprises an amino acid sequence (S/T)-X-(V/I/L)-COOH and another polypeptide which comprises a PDZ domain can be harnessed for preparing polypeptide arrays, as provided by independent claims 1 and 14-16. Accordingly, the cited art does not render the claimed invention obvious.

Regarding claims 2 and 4-9, Applicant respectfully points out that claims 2 and 4-9 depend on and include all the limitations of claim 1. Thus, claims 2 and 4-9 are patentable at least for the reasons set forth above with respect to claim 1.

Regarding claims 17-20, Applicant respectfully points out that claims 17-20 depend on and include all the limitations of claim 16. Thus, claims 17-20 are patentable at least for the reasons set forth above with respect to claim 16.

Accordingly, Applicant respectfully requests that the Examiner reconsider and withdraw the rejection of the claims under 35 U.S.C. §103.

In view of the amendments to the claims and remarks hereinabove,

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Applicant maintains that the pending claims are now in condition for allowance. Accordingly, Applicant earnestly solicits the allowance of the claims.

If a telephone interview would be of assistance in advancing prosecution of the subject application, Applicant's undersigned attorneys invite the Examiner to telephone them at the telephone number provided below.

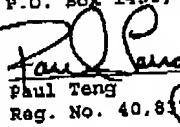
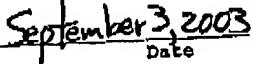
If a petition for an extension of time is required to make this response timely, this paper should be considered to be such a petition, and the Commissioner is authorized to charge the requisite fees to our Deposit Account No. 03-3125.

No fee is deemed necessary in connection with the filing of this Amendment. However, if any additional fee is required, authorization is hereby given to charge the amount of any such fee to Deposit Account No. 03-3125.

Respectfully submitted,


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I hereby certify that this correspondence is being transmitted by facsimile transmission this date and deposited this date with the U.S. Postal Service with sufficient postage as first class mail in an envelope addressed to: Mail Stop AF, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450

 
Date
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